APPENDIX G

Site Descriptions of Sites within the Study Area but Outside of the WDNR Properties

Descriptions of sites outside of the boundaries of those WDNR properties for which new master plans will be developed in the near future. See the main text for more details on site selection, methods, and definitions.

EX01. BLACK RIVER FALLS RAILROAD TRESTLE BARRENS

Subsection:	Central Wisconsin Sand Plain (222Ra)
County:	Jackson
USGS 7.5' Quadrangle:	Black River Falls
Town-Range-Section:	T21N-R4W, sections 1 and 12
Approximate Size:	19

Description of Site

This site is confined to a railroad right--of-way approximately 1 km. long just south of the Black River. The vegetation includes rich patches of native plants usually associated with sand prairie and open pine barrens communities. Surrounding lands have grown up into dense forests of pine and oak, though intensive harvests have opened the canopy in many areas. Historically this site would have been part of an extensive Sand Prairie-Pine Barrens complex.

Significance of Site

This site supports the federally endangered Karner blue butterfly, and contains one of the more diverse assemblages of prairie plants noted by field botanists anywhere in the study area.

Management Considerations

Feasibility of expanding the areas that might support barrens vegetation and associated rare species have not been fully explored here. The sandy outwash plains immediately east of the Black River and north of the city of Black River Falls contain some of the richest remnant patches of prairie flora documented within the study area, but much of the land is severely overgrown with woody species and is in private ownership. Most of these patches are now confined to roadsides or utility corridors.

EX01 - Black River Falls Railroad Trestle Barrens Element Occurrences

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status	US ESA Status
Animals						
Lycaeides melissa samuelis	Karner blue butterfly	1994	S2S3	G5T2	SC/FL	LE
Communities						
Pine Barrens	Pine Barrens	1997	S2	G2	NA	

EX02. BROCKWAY PONDS & PEATLANDS

Subsection:	Central Wisconsin Sand Plain (222Ra)
County:	Jackson
USGS 7.5' Quadrangle:	Hatfield SW
Town-Range-Section:	T21N-R3W, sections 2, 3, 11, and 12
Approximate Size:	698

Description of Site

This poorly drained, nearly level site features a complex of small ponds, at least several of which exhibit natural water level fluctuations. During low water periods, the exposed, unvegetated pond margins can support highly specialized plants, several of which are disjunct from their primary ranges along the Atlantic Coastal Plain in the eastern US. Open, sedge-dominated wetlands are present (Central Poor Fen, and/or Northern Sedge Meadow), and these are best developed toward the eastern side of the site. Patches of alder or willow dominated shrub swamp occur on the wetland margins.

The uplands surrounding the ponds and wetlands support xeric forest composed mostly of pines and oaks, with jack pine the dominant tree species prior to a recent infestation of jack pine budworm that led to intensive salvage operations over much of the site.

Significance of Site

Natural bodies of standing water are very rare in the study area and this site contains the only aggregation of such features that we documented in this landscape. Several rare plants and invertebrates occur here.

Management Considerations

Protection of pond shorelines and site hydrology are the major considerations. No active management is needed at this time, though the shoreline of at least one of the ponds has been abused by irresponsible ATV use. Jackson County is the principal owner, with the eastern edge of the site (and part of the local drainage basin) falling within the boundaries of the Black River State Forest. Management options for the surrounding uplands have not been explored fully, but could include the use of periodic prescribed fire, mechanical brushing, and timber harvest. The ponds and wetlands may need to be posted against ORV/ATV use.

EX02 - Brockway Ponds and Peatlands Element Occurrences

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status	US ESA Status
Animals						
Aeshna verticalis	green-striped darner	1997	S3	G5	SC/N	
Lestes eurinus	amber-winged spreadwing	1997	S3	G4	SC/N	
Lycaeides melissa samuelis	Karner blue butterfly	1996	S2S3	G5T2	SC/FL	LE
Plants						
Carex folliculata	long sedge	1997	S3	G4G5	SC	
Polygala cruciata	crossleaf milkwort	1997	S3	G5	SC	
Scleria reticularis	reticulated nutrush	1997	S1	G4	END	
Thelypteris simulata	bog fern	1997	S3	G4G5	SC	
Communities						
Central Poor Fen	Central Poor Fen	1997	S3		NA	
Coastal Plain Marsh	Coastal Plain Marsh	2000	S1	G2?	NA	

EX03. BAUER BROCKWAY BARRENS

Location

Subsection:	Central Wisconsin Sand Plain (222Ra)
County:	Jackson
USGS 7.5' Quadrangle:	Black River Falls, Hatfield SW
Town-Range-Section:	T21N-R3W, section 16
Approximate Size:	201

Description of Site

Bauer Brockway Barrens occupies a level sand plain bisected from southeast to northwest by Indian Grave Creek, a small, sand-bottomed softwater stream. The site was severely burned in a 1977 fire that killed or set back many of the jack pine and oak trees that then comprised the dominant vegetation. Remnant barrens and sand prairie understory species that had persisted in treeless gaps or along nearby rights-of-way prior to the fire have apparently flourished, and are now widespread and locally dominant throughout much of the site. The native flora is diverse and includes good representation of characteristic groups such as the grasses, asters, blazing stars, goldenrods, sunflowers, milkweeds, and legumes. Oak grubs and scattered growths of young jack pine are common, and dominate some areas. The barrens community supports many "prairie" invertebrates, including several rare species. The state-threatened Blanding's Turtle occurs here. Resident birdlife includes Golden-winged Warbler, Chestnut-sided Warbler, Rufous-sided Towhee, Brown Thrasher, Vesper Sparrow, Clay-colored Sparrow, Field Sparrow, and Black-billed Cuckoo.

Indian Grave Creek is flanked by small, linear patches of wetland vegetation that includes shrub swamp (speckled alder, willow, winterberry holly) and wet meadow (Carex spp., Canada bluejoint grass) communities.

Surrounding land use includes a Jackson County Park (Wazee Park, the site of an abandoned iron mine) and extensive county forest lands, which are managed primarily to produce sustainable crops of trees adapted to droughty, infertile soils. Wetlands (Alder Thicket, Poor Fen, and Northern Sedge Meadow) are common in the local landscape. Ownership of this site is by Jackson County and WDNR-ER.

Significance of Site

The structure, floristic diversity, and rare invertebrates made this site a candidate for special management status, and "Bauer Brockway Barrens" was designated as a State Natural Area in 1997. Jackson County deserves a great deal of credit for their role in facilitating the designation of this important site.

Management Considerations

Periodic prescribed burns or mechanical brushing will be needed to maintain the semi-open conditions that are required by the most sensitive members of the barrens communities, including the rare species know to be present. Periodic monitoring of the vegetation, selected species groups (e.g., birds, herptiles), or rare species is highly desirable. Other county and state forest lands, especially to the north and east, also contain remnant barrens patches. These should be examined carefully to look for opportunities to arrange the configuration of openings utilizing periodic timber sales to connect the Bauer Brockway site with large open wetlands and uplands managed to maintain open conditions in the vicinity of Battle Point and Dike 17 Wildlife Area.

EX03 - Bauer Brockway Barrens Element Occurrences

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status	US ESA Status
Animals						
Atrytonopsis hianna	dusted skipper	1994	S2?	G4G5	SC/N	
Callophrys irus	frosted elfin	2000	S1	G3	THR	
Chlosyne gorgone	gorgone checker spot	1994	S3	G5	SC/N	
Emydoidea blandingii	Blanding's turtle	2001	S3	G4	THR	
Erynnis martialis	mottled dusky wing	1991	S2	G3G4	SC/N	
Erynnis persius	Persius dusky wing	1992	S2	G5	SC/N	
Grammia phyllira	Phyllira tiger moth	1993	S2	G4	SC/N	
Hesperia metea	cobweb skipper	1994	S2	G4G5	SC/N	
Lycaeides melissa samuelis	Karner blue butterfly	1994	S2S3	G5T2	SC/FL	LE
Meropleon ambifuscum	Newman's brocade	1999	S3	G3G4	SC/N	
Papaipema beeriana	Liatris borer moth	1997	SU	G3	SC/N	
Schinia indiana	Phlox moth	1994	S2?	GU	END	
Communities						
Pine Barrens	Pine Barrens	1997	S2	G2	NA	

EX04. MILLSTON BURN BARRENS

Location

Subsection:	Central Wisconsin Sand Plain (222Ra)
County:	Jackson
USGS 7.5' Quadrangle:	Millston
Town-Range-Section:	T20N-R3W, sections 1, 2, 11, and 12
Approximate Size:	1,014

Description of Site

This site is centered on a sandstone-cored ridge that burned severely in a 1977 "wildfire." Small, multi-stemmed "scrub" oaks (black and/or northern pin) are now the dominant vegetative cover in many areas, and most of the gaps created by the fire have already closed in. Small exposures of sandstone occur on the upper slopes of the ridge in several areas. Valleys and flats north and east of the ridge support pine plantations.

The site is just north and east of Interstate Highway 94. Jackson County is the primary owner.

Significance of Site

A number of rare invertebrates and plants have been documented here, almost all of them members of barrens assemblages. For the most part, they are restricted to open edges along trails, roadsides, or cliffs, where tree cover is not dense and conditions have remained relatively favorable for them.

Management Considerations

No specific management considerations are being offered at this time, other than to recognize the desirability of maintaining areas that are presently open and support native prairie vegetation. Restoration opportunities have not been assessed but appear to be significant for portions of the site. The boundary is very generalized and in need of refinement, and was drawn broadly to encompass the occurrences of rare species present, not necessarily to represent a "management" unit.

EX04 - Millston Burn Barrens

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status	US ESA Status
Animals						
Atrytonopsis hianna	dusted skipper	1996	S2?	G4G5	SC/N	
Callophrys henrici	henry's elfin	1996	S2	G5	SC/N	
Callophrys irus	frosted elfin	1996	S1	G3	THR	
Chlosyne gorgone	gorgone checker spot	1996	S3	G5	SC/N	
Erynnis martialis	mottled dusky wing	1995	S2	G3G4	SC/N	
Lycaeides melissa samuelis	Karner blue butterfly	1998	S2S3	G5T2	SC/FL	LE
Schinia indiana	phlox moth	1996	S2?	GU	END	
Plants						
Asclepias ovalifolia	dwarf milkweed	1997	S3	G5?	THR	
Solidago sciaphila	shadowy goldenrod	1997	S3	G3G4	SC	
Strophostyles leiosperma	small-flowered woolly bean	1997	S2	G5	SC	
Talinum rugospermum	prairie fame-flower	1997	S3	G3G4	SC	
Communities						
Oak Barrens	oak barrens	1997	S2	G2?	NA	

EX05. GLEN CREEK BARRENS

Location

Subsection:	Central Wisconsin Sand Plain (222Ra)
County:	Jackson
USGS 7.5' Quadrangle:	Millston
Town-Range-Section:	T20N-R2W, sections 19 and 30
	T20N-R3W, sections 24 and 25
Approximate Size:	311

Description of Site

This site occupies droughty infertile sands on rolling terrain that slopes gently toward the confluence of Glen and Robinson Creeks. Tree cover had been reduced in some areas due to an infestation of jack pine budworm in the late 1980s-early 1990s that thinned crowns of, or killed outright, older jack pine. The native understory has responded favorably to the diminished canopy cover and includes characteristic barrens plants such as goat's rue, rough blazing star, wild lupine, western sunflower, butterfly weed, and the rare dwarf milkweed.

Similar sites on state forest lands to the east were clearcut, treated with herbicides, and planted to red pine. Robinson Creek, and its tributary Glen Creek, are both sand-bottomed, softwater streams with relatively high biological values, that are situated within scenic corridors of large white pine.

Significance of Site

Several rare species occur here, including a federally endangered animal and a state-threatened plant. Robinson Creek State Natural Area is just to the east but is limited to a narrow, forested corridor bordering the stream. Robinson Creek has high biological values from the dam at Millston downstream to the Black River. There is very little development along the stream banks for a distance of over 10 miles.

Management Considerations

Periodic burning or mechanical brushing can be used to maintain open areas, in conjunction with timber management practices that contribute to open conditions around the most sensitive barrens remnants. The County Forest staff will need to be contacted to discuss management options for this site. There is an opportunity here to maintain a small area of pine barrens and several associated rare species populations within a landscape that includes extensive county forest, a State Natural Area, and a biologically important stream.

EX05 - Glenn Creek Barrens Element Occurrences

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status	US ESA Status
Animals						
Lycaeides melissa samuelis	Karner blue butterfly	1997	S2S3	G5T2	SC/FL	LE
Stylurus scudderi	Zebra clubtail	1997	S3	G4	SC/N	
Plants						
Asclepias ovalifolia	Dwarf milkweed	1997	S3	G5?	THR	
Communities						
Pine Barrens	Pine barrens	1997	S2	G2	NA	

EX06. MORRISON CREEK BARRENS

Location

Subsection:	Central Wisconsin Sand Plain (222Ra), Neilsville Sandstone Plateau (222Rb)
County:	Jackson
USGS 7.5' Quadrangle:	Hatfield SE, Hatfield SW
Town-Range-Section:	T21N-R2W, sections 4 and 5
	T22N-R2W, sections 20-23, 26-28, 33, and 34
Approximate Size:	2,716

Description of Site

This extensive area of former pine barrens occurs on nearly level, sandy, soils, on Jackson County Forest land. The barrens remnants are of variable quality, with the most intact areas featuring scattered grubs Hill's/black oak and patches of jack pine, over an understory composed of species such as little bluestem, big bluestem, junegrass, lupine, western sunflower, goat's rue, blueberries, sweet fern, hazelnut, prairie willow, and blazing star. Significant parts of the site have been recently converted to red pine plantations, following salvage cuts to remove budworm-damaged jack pine. Other portions of the site are periodically cut, and managed for even-aged stands of oak and/or aspen. To the west (on State Forest land) this site is bounded by Staffon Flowage, an abandoned cranberry farm with a high quality boggy meadow (Central Poor Fen) just to the southwest. To the northwest is a state correctional facility.

The corridors of Morrison Creek and its tributaries have high biological values and encompass small but valuable patches of wetlands that also support several rare species.

Significance of Site

This is one of the larger areas of remnant barrens vegetation and lands with high barrens management potential in the bed of Glacial Lake Wisconsin east of the Black River State Forest. In size and composition this site compares favorably with the study area's other sites. Lands with similar potential occur just to the east on the Black River State Forest.

The site supports numerous rare plants and animals, including the Karner blue butterfly, a rare tiger beetle, several dragonflies, arctic shrew, and Golden-winged Warbler.

Management Considerations

Continued fire suppression and conversion to pine plantations remain the most important challenges to managing a barrens ecosystem here. The feasibility of expanding the barrens to the north and south of State Highway 54 should be explored, as should possible flexibility in the configuration and timing of conducting timber harvests. Maintenance and expansion of the semi-open barrens vegetation is an especially important consideration at this site, not only because of the substantial population of Karner Blues and other rare species, but because there is an opportunity to connect these lands with open areas to the south and east. Nearby areas on the Black River State Forest, in the vicinity of Dike 17 Wildlife Area and along Morrison Creek also represent important opportunities. Management options should be explored with Jackson County Forest staff, DNR staff from Forestry and Wildlife Management, and other interested parties.

EX06 - Morrison Creek Barrens

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status	US ESA Status
Animals						
Cicindela patruela huberi	a tiger beetle	1996	S3	G3T2	SC/N	
Lycaeides melissa samuelis	Karner blue butterfly	1997	S2S3	G5T2	SC/FL	LE
Communities						
Pine Barrens	Pine Barrens	1999	S2	G2	NA	

EX07. MARTIN MARSH

Location

Subsection:	Central Wisconsin Sand Plain (222Ra)
County:	Jackson
USGS 7.5' Quadrangle:	Hatfield SE
Town-Range-Section:	T21N-R1W, sections 5-8
	T22N-R1W, section 31
	T22N-R2W, section 36
Approximate Size:	764

Description of Site

This large basin contains an extensive boggy meadow dominated by sphagnum mosses, sedges (especially *Carex oligosperma* and *C. utriculata*), and steeplebush. Small patches of shrub swamp, dominated by either speckled alder or bog birch, are present. There are also limited areas of small swamp conifers in the basin, with tamarack or jack pine the most important tree species.

Significance of Site

This site contains a large occurrence of Central Poor Fen, albeit one that has been periodically affected by the removal of the dominant plants, the sphagnum mosses. Site hydrology is apparently intact, a rare attribute for a peatland of this size in this landscape. Rare birds, e.g., Henslow's Sparrow and Northern Harrier, were noted here in the early 1980s, but no formal bird surveys have been conducted here since then.

Management Considerations

Sphagnum moss has been harvested repeatedly from much of the basin. This site is a strong candidate for inclusion within a region-wide study to examine the effects of moss harvest. Periodic breeding bird surveys should be conducted here, as habitat conditions do not appear to have been appreciably altered since the 1980s (though no Henslow's Sparrows were found during this study at several nearby locations that had supported them in the early `80s).

EX07 - Martin Marsh Element Occurrences

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status	US ESA Status
Animals						
Cicindela patruela huberi	a tiger beetle	1971	S3	G3T2	SC/N	
Emydoidea blandingii	Blanding's turtle	1999	S3	G4	THR	
Euphyes bimacula	two-spotted skipper	1989	S2S3	G4	SC/N	
Lycaeides melissa samuelis	Karner blue butterfly	1993	S2S3	G5T2	SC/FL	LE
Plants						
Bartonia virginica	yellow screwstem	1958	S3	G5	SC	
Polygala cruciata	crossleaf milkwort	1997	S3	G5	SC	
Communities						
Northern Sedge Meadow	Northern Sedge Meadow	1981	S3	G4	NA	
Northern Wet Forest	Northern Wet Forest	1981	S4	G4	NA	
Southern Dry-Mesic Forest	southern dry-mesic forest	1981	S3	G4	NA	

EX08. SADDLE MOUND BARRENS & DRY FOREST

Subsection:	Central Wisconsin Sand Plain (222Ra)
County:	Jackson
USGS 7.5' Quadrangle:	Hatfield SE, Spaulding
Town-Range-Section:	T21N-R1W, sections 3, 4, 27, 28, and 33-35
Approximate Size:	1,008

Description of Site

This large pine-oak and pine barrens is centered on Saddle Mound, an east to west trending, one mile long, 400 foot high Cambrian sandstone "hogback" outcrop, as well as a number of smaller satellite mounds (such as 300 foot high Sugar Loaf Mound) to the southeast. State Highway 54 bisects the site from west to east, and Pray Road crosses it from north to south in the western part of the complex. The entire site is situated on very dry soil, much of it nearly pure sand, with Cambrian sandstone near the surface. Shrubby jack pine and Hill's oak (3-6" in diameter and only 4-7 meters tall) currently dominate the vegetation, over a depauperate understory of Penn sedge, bracken fern, huckleberry, poverty oat-grass, and early blueberry. There are scattered, usually small, openings that support a sand prairie flora that includes species such as lupine, little bluestem, big bluestem, showy goldenrod, foxglove, common blazing-star, and smooth aster.

Saddle Mound itself has a number of small patch communities treated as inclusions, such as dry cliff, moist cliff, and northern dry and dry-mesic forest. The south facing cliffs support an assemblage of drought adapted plants, including rock spikemoss, false heather, rough goldenrod, and sand cherry; these are now quite overgrown with trees and shrubs due to long periods of fire suppression. On the moister, shadier north face of the mound there are richer, better-developed, stands of red oak, red maple, paper and yellow birches, and aspens. The understory here supports northern species such as Labrador tea (on damp acid cliffs), bluebead lily, Canada honeysuckle, showy mountain-ash, and many ferns. There is an active lookout tower on top of the mound, and some erosion in the steep, sandy access roads and trails. Several rare plants and the rare Karner blue butterfly occur at the site. The surrounding are is used for timber production, recreation, and cranberry cultivation. The small village of Pray is located about one mile to the north.

Significance of Site

This is the highest point in Jackson County and the bed of extinct Glacial Lake Wisconsin, and represents an opportunity for large scale barrens restoration, extensive dry forest management, and rare species protection.

Management Considerations

The relative merits of barrens restoration and extensive forest management, or a mixture of both, need to be compared with other, similar opportunities in the central sands. Rare species protection is also an important consideration here.

EX08 - Saddle Mound Barrens and Dry Forest Element Occurrences

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status	US ESA Status
Animals						
Gomphus viridifrons	green-faced clubtail	1997	S3	G3	SC/N	
Lycaeides melissa samuelis	Karner blue butterfly	1995	S2S3	G5T2	SC/FL	LE
Plants						
Huperzia porophila	rock clubmoss	1997	S3	G4	SC	
Viola fimbriatula	sand violet	1997	S2	G5	END	
Communities						
Pine barrens	pine barrens	1997	S2	G2	NA	

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status	US ESA Status
White pine-red maple swamp	white pine-red maple swamp	1981	S2	G3G4	NA	

EX09. PRAY FEN

Location

Subsection:	Central Wisconsin Sand Plain (222Ra), Neilsville Sandstone Plateau (222Rb)
County:	Jackson
USGS 7.5' Quadrangle:	Hatfield SE, Spaulding
Town-Range-Section:	T22N-R1W, sections 20 and 21
Approximate Size:	157

Description of Site

This peatland is located just south of Old State Highway 54 and just west of the village of Pray. The primary community is a boggy meadow (poor fen – central type), but the best (albeit small) quality areas have a more nutrient-demanding flora than any other open peatland documented in the bed of extinct Glacial Lake Wisconsin. Sedges were more common than sphagnum mosses in the areas surveyed, and include wire-leaved, broad-leaved, and tussock-forming species. Other characteristic plants include hardhack, chokeberry, white beakrush, balsam willow, rose pogonia, grass pink orchid, round-leaved and intermediate sundews, Buxbaum's sedge, and Arethusa orchid (very rare in central and southern Wisconsin).

To the west site conditions are wetter, with Small's spikerush inhabiting shallow pools of standing water. Farther south is a fringe of alder thicket, and, south of that, a small swampy stand of second-growth white pine, red maple, jack pine, Hill's oak, cinnamon fern, skunk cabbage, and winterberry holly. Several rare plant species are present.

In a larger context, this site is embedded in an area utilized for commercial forestry, cranberry cultivation, and recreation.

Significance of Site

The ecologically richest portions of this site support more nutrient-demanding plant species than are typically found in the central sands poor fens. That factor alone makes additional protection a priority consideration. A number of rare species were documented here, including several that are rare elsewhere in the central sands. Rare animals are known to inhabit nearby forests.

Management Considerations

Site hydrology is impacted by the maintenance of roads and a railroad grade to the north, and the channelization of White Creek, which bisects the site from east to west. Any future alteration of hydrology, including restoration activities, should consider effects on the unusual aspects of this wetland. Additional data on water chemistry, nutrient levels, and water flow is highly desirable here, as is vegetation sampling. Commercial moss harvest is not recommended at this time.

EX09 - Pray Fen Element Occurrences

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status
Animals					
Sorex hoyi	pigmy shrew	1976	S3	G5	SC/N
Plants					
Arethusa bulbosa	swamp-pink	1998	S3	G4	SC
Bartonia virginica	yellow screwstem	1998	S3	G5	SC
Polygala cruciata	crossleaf milkwort	1998	S3	G5	SC
Communities					

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status
Central poor fen	central poor fen	1998	S3		NA

EX10. AMMUNDSON MARSH

Location

Subsection:	Neilsville Sandstone Plateau (222Rb)
County:	Jackson
USGS 7.5' Quadrangle:	City Point NE, City Point NW
Town-Range-Section:	T22N-R1E, sections 3, 4, 8-11, and 15-17
Approximate Size:	1606

Description of Site

This site encompasses a large, acid, open peatland currently typed as a Central Poor Fen. The dominant plants are wire-leaved sedges and sphagnum mosses. There are several small forested "islands" within the open peatland, and a 40 acre tamarack swamp in the eastern part of the basin. Water drains from the wetland into the East Fork of the Black River via at least small headwaters creeks. The ownership is approximately equally divided between Jackson County and private owners. The commercial harvest of sphagnum moss has been widespread, and has occurred frequently in some parts of the basin. Updated survey work is needed here. A small dam at the southwest corner of the site has apparently not had a significant impact on site hydrology. This wetland is bordered by nearly level, sandy uplands supporting a managed forest of pines, oaks, and aspen. Recreational use is significant. There is a commercial cranberry operation to the south of the site.

Significance of Site

This large peatland has escaped the severe hydrologic alterations that have influenced a majority of the wetlands in this region.

Management Considerations

Throughout the central sands, the impacts of mossing need additional study to enable managers to make more informed land use decisions. This site would be an excellent candidate for inclusion in such a project. Additional surveys for rare species are desirable, particularly for birds and specialized invertebrates.

EX10 - Ammundson Marsh Element Occurrences

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status
Communities					
Central Poor Fen	Central Poor Fen	1980	S3		NA

EX11. SPAULDING PEATLANDS

Subsection:	Central Wisconsin Sand Plain (222Ra)
County:	Jackson
USGS 7.5' Quadrangle:	Spaulding
Town-Range-Section:	T21N-R1E, sections 5 and 6
	T21N-R1W, sections 1 and 12
	T22N-R1E, sections 28, 29, and 31-33
Approximate Size:	758

Description of Site

These peatlands are located in or close to the bed of extinct Glacial Lake Wisconsin. They are located to the south of State Trunk Highway 54, to the east of Lone Pine Lane, and to the north of Ellis Lane. The open wetland is a boggy meadow (Central Poor Fen) dominated by sphagnum mosses and various sedges. Small acreages of tamarack-dominated conifer swamp and shrub swamp also occupy portions of this basin**.** The southwestern portion of the wetland fen has been altered by the repeated commercial harvest of moss but basin hydrology is far less compromised than for most of the larger peatlands in the ecoregion.

At least two rare invertebrates reside in the open peatland. Several rare bird species were documented here in the early 1980s (Northern Harrier, Henslow's Sparrow). These breeding bird surveys should be rerun, as this site got limited attention during the current inventory project.

The surrounding uplands are forested with Hill's oak and jack pine and are utilized for timber production and recreation. To the south and northeast, continuations of this peatland are utilized for mossing and limited timber production.

Significance of Site

This basin is relatively unimpacted by dikes, ditches, or water control structures. Several rare animals inhabit the open wetlands.

Management Considerations

Maintain site hydrology. Spaulding Peatlands is a strong candidate for inclusion in a study on the effects of commercial moss harvest. Highway 54 crosses the north end of the wetland basin but hydrological impacts are not obviously significant. Periodic monitoring to assess vegetation changes and trends is desirable.

EX11 - Spaulding Peatlands Element Occurrences

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status
Animals					
Oeneis jutta	jutta arctic	1999	S3	G5	SC/N
Williamsonia fletcheri	ebony bog haunter	1999	S3S4	G3G4	SC/N
Plants					
Utricularia geminiscapa	hidden-fruited bladderwort	1997	S3	G4G5	SC
Communities					
Central Poor Fen	Central Poor Fen	1980	S3		NA
Northern Sedge Meadow	Northern Sedge Meadow	1981	S3	G4	NA
Northern Wet Forest	Northern Wet Forest	1981	S4	G4	NA

EX12. DEER ISLAND CONIFER SWAMP

Subsection:	Central Wisconsin Sand Plain (222Ra)
County:	Jackson
USGS 7.5' Quadrangle:	City Point, Spaulding
Town-Range-Section:	T21N-R1E, sections 5-24
	T21N-R1W, sections 12, 13, and 24
	T21N-R2E, sections 7 and 18
Approximate Size:	8,300

Description of Site

This extensive, remote, relatively undeveloped site encompasses several mapped community occurrences of Northern Wet Forest (Black Spruce Swamp, Tamarack Swamp) and White Pine-Red Maple Swamp. They occur in a level basin in the sandy bed of extinct Glacial Lake Wisconsin. The Northern Wet Forests are composed of black spruce and tamarack, with occasional white pine. Structure varies from high canopy closure to somewhat open. Seedlings and saplings of the dominant trees are at leas locally common. The major soil type is Loxley Peat. Shrub layer dominants include huckleberry, winterberry holly, swamp dewberry, and mountain holly. The herbaceous layer is composed of sphagnum mosses, cinnamon fern, narrow-leaved sedges, bunchberry, and cotton-grasses are frequent. In some areas the shrub component includes acidophiles such as bog laurel and bog rosemary.

These wet acid swamps of spruce and tamarack grade into wet-mesic stands of White Pine-Red Maple Swamp on their upland margins, most of which show evidence of selectively logging. Important shrubs include speckled alder, winterberry holly, and mountain holly. A thin but often continuous carpet of sphagnum mosses is present, and cinnamon fern and skunk cabbage are abundant. Soils are typed as Dawsil Mucky Peat of the Ironrun – Pony Creek Complex.

Large, open, sedge-dominated peatlands to the east (e.g., near Cranberry Road) are privately-owned and inaccessible, but provide good quality habitat for a number of rare species.

A sandy, often all but impassable, two-track road traverses the site from east to west and separates the two large blocks of conifer swamp. Ditches have affected site hydrology, though in some areas impacts do appear to be severe, at least at this time. Other areas may be drying out, and in some cases water level manipulations (including beaver dams) have drowned stands of trees. Low sandy ridges bordering the wetlands are forested with mixtures of species adapted to dry acid conditions that are characteristic of this region, such as oaks (including Hill's/black, white, red, and bur), aspens, red maple, and paper birch. Land control is about evenly divided between Jackson County and large private landowners (principally cranberry growers who have cultivate this crop to the east and north).

Significance of Site

This site is significant for its large size, but its quality and long-term viability may have been compromised by hydrologic modifications, especially ditching. Additional survey work is needed, with a breeding bird survey and rare plant work the highest priorities. Central Wisconsin conifer swamps constitute highly significant habitat for many northern birds, some of which are rare or highly localized in southern Wisconsin. Several rare plants were documented here.

Management Considerations

Collect additional information to better establish the site's values. Monitor changes in hydrologic regime, vegetation structure, and composition.

EX12 - Deer Island Conifer Swamp Element Occurrences

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status	US ESA Status
Animals						
Chlidonias niger	Black Tern	1999	S3B,SZN	G4	SC/M	
Cicindela patruela huberi	a tiger beetle	1972	S3	G3T2	SC/N	
Haliaeetus leucocephalus	Bald Eagle	1981	S2N,S3B	G4	SC/FL	LT,PD
Hemileuca sp 3	Midwestern fen buckmoth	1970	S3S4	G3G4Q	SC/N	
Ixobrychus exilis	Least Bittern	1999	S3B,SZN	G5	SC/M	
Oporornis agilis	Connecticut Warbler	1999	S3B,SZN	G4	SC/M	
Psinidia fenestralis	sand locust	1998	S1S2	G5	SC/N	
Somatochlora incurvata	warpaint emerald	1998	S2	G4	END	
Plants						
Bartonia virginica	yellow screwstem	1997	S3	G5	SC	
Carex folliculata	long sedge	1997	S3	G4G5	SC	
Polygala cruciata	crossleaf milkwort	1997	S3	G5	SC	
Thelypteris simulata	bog fern	1997	S3	G4G5	SC	
Utricularia geminiscapa	hidden-fruited bladderwort	1998	S3	G4G5	SC	
Communities						
Northern Wet Forest	Northern Wet Forest	1997	S4	G4	NA	
White Pine-Red Maple Swamp	White Pine-Red Maple Swamp	1997	S2	G3G4	NA	

EX13. MCKENNA CREEK PEATLANDS

Location

Subsection:	Central Wisconsin Sand Plain (222Ra)
County:	Jackson
USGS 7.5' Quadrangle:	Spaulding
Town-Range-Section:	T21N-R1W, sections 21-28
Approximate Size:	

Description of Site

This site features a second-growth stand of dry-mesic forest dominated by medium-sized white and red pines. Canopy associates include red maple and oaks. White pine is well-represented in the sapling layer. Shrubs include witch hazel, hazelnut, huckleberry, and blueberries. Common herbs are Penn sedge, bracken fern, wintergreen, starflower, Canada mayflower, and wild sarsaparilla, and clubmosses. The forest is situated on a sandy ridge near the margin of extinct Glacial Lake Wisconsin.

Goodyear Road, a sandy two-track that was formerly a railroad grade, is immediately adjacent to the site. To the east there is an extensive complex of sandy ridges interspersed with parallel fingers of peatland communities that should be surveyed in the future.

Significance of Site

This site represents one of the more intact stands of pine-dominated dry-mesic forest in the study area.

Management Considerations

Jackson County is the owner. County Forest staff should be contacted to review any existing management plans, and explore future options for this site.

EX13 - Mckenna Creek (Big Cut) Pines Element Occurrences

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status
Communities					
Northern Dry-Mesic Forest	Northern Dry-mesic Forest	1997	S3	G4	NA

EX14. BEAR BLUFF PEATLANDS

Location

Subsection:	Central Wisconsin Sand Plain (222Ra)
County:	Jackson
USGS 7.5' Quadrangle:	Warrens East, City Point, Mather, Spaulding
Town-Range-Section:	T20N-R1E, sections 3-20 and 30
	T20N-R1W, sections 1, 2, 11-14, and 23-26
	T21N-R1E, sections 19-23 and 26-34
	T21N-R1W, sections 24-26, 35, and 36
Approximate Size:	18,680

Description of Site

This vast complex occupies the least developed portions of an area formerly occupied or strongly influenced by the bed of extinct Glacial Lake Wisconsin. The major community include open acid peatlands of bog, poor fen, and muskeg; acid conifer swamps of several types; and sandy upland forested with pine, oak, and aspen. Some of the individual community patches are quite large, covering several hundred acres. Small patch communities are also present, and these include pine barrens, alder thicket, and dry cliff. One of the larger relatively undisturbed open peatlands differs from those found at most other locations in the central sands in that ericaceous shrubs, especially leatherleaf, are among the dominants. Sphagnum mosses and sedges are the other dominant plants. In some areas a muskeg of scattered, stunted black spruce and tamarack is present. This in turn grades into a boggy forest of rather small black spruce and tamarack, with a well-developed tall shrub layer composed of huckleberry, chokeberry, winterberry holly, speckled alder, mountain holly, and bog birch. Beneath the tall shrub stratum the understory consists mostly of sphagnum mosses, sedges, and Labrador tea. At the margins of this acid conifer swamp there are sometimes stands of wet-mesic white pine-red maple swamp, that sometimes contain small amounts of yellow birch.

The extensive upland forests occur on low sandy hills, ridges, and on islands within the extensive bogs and fens. The dominant trees are pines, oaks, aspens, and paper birch, in various mixtures. Red pine plantations are prominent in some areas. Bear Bluff, a prominent 230 foot high outcrop of Cambrian sandstone, is vegetated with a second-growth forest of white and red pines, several oaks, and aspen.

Numerous rare or regionally uncommon animals and plants, many with northern affinities, are present. These include sandhill crane, northern harrier, yellow-bellied flycatcher, white-throated sparrow, raven, and timber wolf. Rare plants present include bog fern, long sedge, and cliff goldenrod. Surrounding lands are used for cranberry cultivation (to the south and east), and commercial forestry (to the north and west). Sandy two track roads traverse the western and northern margins of the site.

Significance of Site

This site encompasses a representative and relatively undeveloped portion of the Glacial Lake Wisconsin landscape. The vast peatlands and extensive forests support a high diversity of plants and animals that are either rare elsewhere in the state or are generally restricted to the north. Examples of these include timber wolf, black bear, northern goshawk, sharp-shinned hawk, sharp-tailed grouse, northern raven, saw-whet owl, many “northern “wood warblers, LeConte’s sparrow, Lincoln’s sparrow, and many rare plants and invertebrates.

Management Considerations

Though wild and relatively undeveloped, much of the site has been affected by hydrologic alterations (ditching and diking), past forest exploitation, suppression of wildfire, commercial harvest of sphagnum moss, and encroachments from agricultural developments. Fortunately, the ditches are rather distantly spaced and there are no impoundments, so the alteration has not been extreme. A significant percentage of this large site is in a few large, private ownerships.

EX14 - Bear Bluff Peatlands Element Occurrences

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status
Animals					
Aeshna tuberculifera	black-tipped darner	1997	S3	G4	SC/N
Aeshna verticalis	green-striped darner	1999	S3	G5	SC/N
Ammodramus henslowii	Henslow's sparrow	1994	S2S3B,SZN	G4	THR
Gavia immer	common loon	1999	S3S4B,SZN	G5	SC/M
Hemileuca sp 3	Midwestern fen buckmoth	1970	S3S4	G3G4Q	SC/N
Oeneis jutta	jutta arctic	1994	S3	G5	SC/N
Psinidia fenestralis	sand locust	1998	S1S2	G5	SC/N
Somatochlora franklini	delicate emerald	1998	S2S3	G5	SC/N
Somatochlora incurvata	warpaint emerald	1998	S2	G4	END
Somatochlora kennedyi	Kennedy's emerald	1990	S3	G5	SC/N
Somatochlora tenebrosa	clamp-tipped emerald	1989	S2	G5	SC/N
Spharagemon marmorata	northern marbled locust	1998	S2S3	G5	SC/N
Williamsonia fletcheri	ebony bog haunter	1999	S3S4	G3G4	SC/N
Williamsonia lintneri	ringed boghaunter	1998	S2S3	G3	SC/N
Plants					
Bartonia virginica	yellow screwstem	1997	S3	G5	SC
Carex cumulata	clustered sedge	1997	S2	G4?	SC
Carex folliculata	long sedge	1997	S3	G4G5	SC
Gnaphalium helleri	Catfoot	1998	S1	G4G5	SC
Polygala cruciata	crossleaf milkwort	1997	S3	G5	SC
Solidago sciaphila	shadowy goldenrod	1997	S3	G3G4	SC
Strophostyles leiosperma	small-flowered woolly bean	1997	S2	G5	SC
Thelypteris simulata	bog fern	1997	S3	G4G5	SC
Utricularia geminiscapa	hidden-fruited bladderwort	1958	S3	G4G5	SC
Communities					
Central Sands Pine-Oak Forest	Central Sands Pine-Oak Forest	1997	S3	G3	NA
Northern Dry-mesic Forest	Northern Dry-mesic Forest	1997	S3	G4	NA
Northern Wet Forest	Northern Wet Forest	1997	S4	G4	NA
Open Bog	Open bog	1986	S4	G5	NA
Tamarack (poor) Swamp	Tamarack (poor) Swamp	1997	S3	G4	NA

EX15. JAY CREEK PINE FOREST

Location

Subsection:	Central Wisconsin Sand Plain (222Ra)
County:	Jackson
USGS 7.5' Quadrangle:	Warrens East, Warrens West
Town-Range-Section:	T20N-R1W, sections 21, 22, 27, 28, 33, and 34
Approximate Size:	1,220

Description of Site

The site is located approximately three miles to the east of the southeast corner of the Black River State Forest, encompassing the headwaters and upper reaches of Jay Creek, a tributary of the Lemonweir River. Most of the site is forested, with extensive stands of older second-growth white pine-red maple swamp. Canopy associates include yellow birch, paper birch, red oak, red pine, and black spruce. The understory is composed of sphagnum mosses, skunk cabbage, goldthread, sedges, and dense growths of cinnamon fern. Thickets of winterberry holly and sapling white pine are common and scattered throughout the forest. The forest is laced with springs and spring runs that feed Jay Creek. The surrounding vegetation is a matrix of commercial managed pine-oak forest, some in private lands, the rest part of the Jackson County Forest.

The adjoining uplands typically support dry-mesic forest of white pine, red pine, red maple, black/Hill's oak, red oak, and paper birch, over hazelnut, bracken fern, early blueberry, wintergreen, and huckleberry. Stand condition is variable, but some are relatively intact, with large trees and high canopy closure.

Resident birds include Northern Raven, Red-breasted Nuthatch, Veery, Canada Warbler, Blackburnian Warbler, Black-throated green Warbler, Pine Warbler, Blue-headed Vireo, Winter Wren, and Red-shouldered Hawk.

Significance of Site

This is one of the finest examples in the state of a mature White Pine – Red Maple Swamp. Few, if any, forests of this type of comparable size or quality have been documented by the Natural Heritage Inventory elsewhere in the state. The majority of stands of this forest community are associated with the margins of extinct Glacial Lake Wisconsin in the Central Sands ecoregion.

Large populations of the rare disjunct plants bog fern and long sedge are present. The avifauna includes rare species and significant numbers of other birds that are generally rare this far south in Wisconsin.

Management Considerations

Part of this site is owned by the WDNR and has been designated as a State Natural Area. Watershed protection, increasing the area of forest within the SNA, and working with nearby landowners to maintain a high percentage of forest cover in the local landscape are key management considerations. Forest management compatibility is also important to ensure the long-term viability of both the communities and the sensitive species populations present.

EX15 - Jay Creek Pine Forest Element Occurrences

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status
Animals					
Accipiter gentilis	Northern Goshawk	1982	S2N,S2B	G5	SC/M
Buteo lineatus	Red-shouldered Hawk	1994	S1N,S3S4B	G5	THR

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status
Somatochlora elongata	Ski-tailed emerald	1997	S2S3	G5	SC/N
Somatochlora tenebrosa	Clamp-tipped emerald	1997	S2	G5	SC/N
Plants					
Carex folliculata	Long sedge	1991	S3	G4G5	SC
Thelypteris simulata	Bog fern	1973	S3	G4G5	SC
Communities					
Northern Dry Forest	Northern Dry Forest	1981	S3	G3?	NA
Southern Dry Forest	Southern Dry Forest	1981	S3	G4	NA
Stream—Slow, Soft, Cold	Stream--Slow, Soft, Cold	1981	SU		NA
White Pine-Red Maple Swamp	White Pine-Red Maple Swamp	1981	S2	G3G4	NA

EX16. SPRAGUE-MATHER FLOWAGE BARRENS - WEST

Location

Subsection:	Central Wisconsin Sand Plain (222Ra)
County:	Juneau
USGS 7.5' Quadrangle:	Finley
Town-Range-Section:	T19N-R2E, sections 1 and 6
	T20N-R2E, sections 36
Approximate Size:	350

Description of Site

This is an oak barrens on the northwest side of Sprague-Mather Flowage that has been restored to "brush prairie" status by a combination of mechanical brushing and prescribed burning. The dominant/characteristic vegetation is a mixture of heathland and sand prairie species. Especially prominent are grubs of Hill's oak (20-30% cover), little bluestem, junegrass, lupine, showy goldenrod, blueberries, azure aster, and sweet fern. Resident animals include Karner blue butterfly, common nighthawk, towhee, brown thrasher, and yellow warbler. Historical records indicate that the site was originally an open pine barrens, but pine has been locally eliminated and now Hill's oak is the dominant tree.

Surrounding lands and waters are used for resource protection and recreation. Nearby wetlands have been hydrologically altered via the construction of an extensive ditch system in the 1920s or 30s. Once the focus shifted to wildlife protection, the ditches were plugged and a dike system was built to create large flowages. Following severe fires in the 1930s and failed attempts at agriculture, the implementation of fire suppression policies had led to the development of a densely stocked, closed canopy forest of oak, pine, and aspen.

Significance of Site

The site has a good complement of prairie and barrens associated plants and animals, including the Karner blue butterfly. It is not a large site, but could be expanded.

Management Considerations

The site is being actively managed to maintain and restore a barrens community and provide habitat for associated species, including the federally endangered Karner blue butterfly.

EX16 - Sprague Mather Flowage Barrens-West Element Occurrences

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status	US ESA Status
Animals						
Clemmys insculpta	wood turtle	1985	S3	G4	THR	
Lycaeides melissa samuelis	Karner blue butterfly	1996	S2S3	G5T2	SC/FL	LE
Communities						
Northern Sedge Meadow	Northern Sedge Meadow	1982	S3	G4	NA	
Oak Barrens	Oak Barrens	1992	S2	G2?	NA	
Shrub-Carr	Shrub-Carr	1982	S4	G5	NA	

EX17. SPRAGUE-MATHER FLOWAGE BARRENS - EAST

Location

Subsection:	Central Wisconsin Sand Plain (222Ra)
County:	Juneau
USGS 7.5' Quadrangle:	Finley
Town-Range-Section:	T20N-R3E, sections 28 and 33
Approximate Size:	323

Description of Site

This site occupies a series of low, curving, sandy, infertile ridges (on the eastern border of the Sprague-Mather Flowage within Necedah National Wildlife Refuge. The primary plant community is a managed oak barrens with a brush prairie aspect. A small grove of Hill's oak woodland occurs on the eastern edge of the site. Hill's (and/or black) oak grubs 1-2.5 meters high are abundant. Characteristic groundlayer plants include little bluestem, Junegrass, sweet fern, showy goldenrod, lupine, rough blazing star, early blueberry, and western sunflower.

Rare invertebrates occur at the site, including the Karner blue and Persius dusky-wing butterflies). Resident birds include Common Nighthawk, Eastern Kingbird, Rufous-sided Towhee, Brown Thrasher, Chestnut-sided and Yellow Warblers, Black-billed Cuckoo, and Eastern Bluebird.

The site occurs on an ancient dune system created shortly after now extinct Glacial Lake Wisconsin drained. Surrounding lands are used primarily for resource protection and recreation. In the past, this landscape was greatly modified by drainage schemes, attempts at agriculture, and severe fires.

Significance of Site

The site is small, but similar communities are located nearby and expansion or connection of the existing patches is feasible. Invasive plants are relatively scarce, and the native barrens flora is representative. A number of rare or otherwise significant animals are present.

Management Considerations

The site is currently managed by prescribed burning and mechanical brushing. A landscape-scale mosaic of uplands and wetlands provides management flexibility for fire-sensitive but disturbance dependent species (such as the Karner blue). Design of prescribed burn units needs to ensure the long-term viability of fire sensitive species that have poor dispersal capabilities, such as the Karner blue. Diverse vegetation structure should be maintained in the vicinity, but appropriate areas should be managed permanently in a semi-open barrens condition. Expansion and connection of the existing barrens remnants is an important consideration.

EX17 - Sprague Mather Flowage Barrens-East Element Occurrences

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status	US ESA Status
Animals						
Hesperia leonardus leonardus	Leonard's skipper	1992	S3	G4T4	SC/N	
Lycaeides melissa samuelis	Karner blue butterfly	1996	S2S3	G5T2	SC/FL	LE
Plants						
Bartonia virginica	yellow screwstem	1998	S3	G5	SC	
Polygala cruciata	crossleaf milkwort	1997	S3	G5	SC	
Utricularia geminiscapa	hidden-fruited bladderwort	1998	S3	G4G5	SC	

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status	US ESA Status
Communities						
Northern Sedge Meadow	Northern Sedge Meadow	1982	S3	G4	NA	
Oak Barrens	Oak Barrens	1992	S2	G2?	NA	
Shrub-Carr	Shrub-Carr	1982	S4	G5	NA	

EX18. NECEDAH OAK-PINE SAVANNA

Map ID# EX18

Location

Subsection:	Central Wisconsin Sand Plain (222Ra)
County:	Juneau
USGS 7.5' Quadrangle:	Finley
Town-Range-Section:	T19N-R2E, sections 12
	T19N-R3E, sections 7
Approximate Size:	274

Description of Site

The core of the primary community represented here is a dry jack pine – Hill's oak forest classified as pine barrens (130 acres). The site is located in the bed of extinct Glacial Lake Wisconsin about one mile south of the western end of the Goose Pool portion of the Sprague-Mather Flowage. The terrain is near-level, offering little topographic relief. The canopy is semi-open, and the understory supports many characteristic barrens and sand prairie species. Representative plants include little bluestem, junegrass, Indian grass, prairie willow, sweet fern, bastard toadflax, flowering spurge, lupine, goat's rue, bird-foot violet, slender beard-tongue, and stiff coreopsis.

The site has a history of logging, fire, and ditching in the low areas. The lowlands include patches of sedge meadow and alder thicket. The vegetation at the site prior to European settlement in the nineteenth century has been interpreted as a semi-open jack pine-oak barrens, with tree densities in the range of 2-8 trees per acre.

Significance of Site

This site occurs within the Necedah National Wildlife Refuge and was established as a State Scientific Area (now State Natural Areas program) in 1966. The barrens community is rare in the present landscape and the central sands region offers excellent opportunities for restoration. Many rare species have been documented as residents of barrens remnants in the vicinity.

Management Considerations

The site has been managed with prescribed fire since 1966 to maintain and restore the formerly widespread and abundant open barrens conditions that are relatively rare in today's landscape. No management changes are recommended, though the site is small, embedded within an extensive area of dense xeric forest, and would benefit from an expansion of the burn program.

Baseline data are available for vegetation and breeding birds and sampling should be repeated periodically.

EX18 - Necedah Oak-Pine Savanna Element Occurrences

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status	US ESA Status
Animals						
Lycaeides melissa samuelis	Karner blue butterfly	1994	S2S3	G5T2	SC/FL	LE
Communities						
Alder thicket	alder thicket	1981	S4	G4	NA	
Northern dry forest	northern dry forest	1981	S3	G3?	NA	
Northern sedge meadow	northern sedge meadow	1981	S3	G4	NA	
Pine barrens	pine barrens	1986	S2	G2	NA	

EX19. NECEDAH OAK-PINE FOREST

Location

Subsection:	Central Wisconsin Sand Plain (222Ra)
County:	Juneau
USGS 7.5' Quadrangle:	Necedah
Town-Range-Section:	T18N-R3E, sections 2 and 3
	T19N-R3E, sections 34 and 35
Approximate Size:	84

Description of Site

This site contains a xeric forest of Hill's oak and jack pine that originated in the 1930's, after a severe fire that burned thousands of acres in the eastern part of what is now the Necedah National Wildlife Refuge. The soils are sands of the Newton, Plainfield, and Morocco series, on gently rolling terrain in central sands. The forest understory is depauperate, with Penn sedge, bracken fern, and blueberries the dominant groundcover. Other characteristic plants include trailing arbutus, wintergreen, pipsissewa, whorled loosestrife, and moccasin flower. There are also forbs attesting to the formerly more open conditions that characterized this site and the surrounding landscape prior to the widespread implementation of fire suppression policies in the 1930s. Among these are stiff coreopsis, lupine, goat's rue, euphorbia, and purple milkwort. Representative breeding birds include Red-eyed Vireo, Ovenbird, Great-crested Flycatcher, White-breasted Nuthatch, and Eastern Wood Pewee.

The surrounding landscape is mostly forested, and managed for wildlife protection, recreation, and commercial timber production. Several small abandoned agricultural fields adjoin the forest, and a road runs along the site's southern border. An ambitious savanna restoration project is underway just a few miles to the west.

Significance of Site

Part of the Necedah National Wildlife Refuge, owned by the US Fish and Wildlife Service, this site was designated as a State Scientific Area (now the State Natural Areas program) in 1952. The site is also a designated Society of American Foresters type stand.

Management Considerations

Necedah oak-pine forest was initially established to maintain a representative stand of central sands xeric forest in an unmanaged condition. In 1998 Necedah Refuge staff requested permission from BER to implement a prescribed burning and tree removal program to restore the more open conditions formerly prevalent here. BER approved this request.

No further recommendations are made beyond encouraging both the State Natural Areas program staff (WDNR-BER) and the Necedah Refuge staff to periodically monitor the site. As quantitative baseline data exist for this occurrence, we recommend that the vegetation sampling be repeated at appropriate intervals. A permanent breeding bird survey transect is established on this site, and is repeated approximately every five years.

EX19 - Necedah Oak-Pine Forest

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status
Communities					
Northern dry forest	northern dry forest	1998	S3	G3?	NA

EX20. RYNEARSON FLOWAGE BARRENS

Location

Subsection:	Central Wisconsin Sand Plain (222Ra)
County:	Juneau
USGS 7.5' Quadrangle:	Cutler
Town-Range-Section:	T18N-R3E, sections 4-6, 9, and 10
	T19N-R3E, sections 29 and 32
Approximate Size:	751

Description of Site

This site encompasses two mixed pine-oak barrens communities, located, respectively, on the east and near-north sides of the Rynearson Flowage, a large impoundment located in the flat to gently rolling sandy bed of extinct Glacial Lake Wisconsin. The easternmost barrens patch is characterized by scattered Hill's oak (from very large open-grown trees, to grubs) and small of jack pine. The understory consists mostly of prairie grasses and forbs such as big and little bluestems, Indian grass, June grass, Penn sedge, and scattered patches of heath, with blueberries, sweetfern, and bearberry.

The original government land survey notes for the area indicate that pine barrens was the major upland community in the area, but the present aspect is more of an oak barrens. Pole timber was cut from this site in the 1960s after which a regime of prescribed burning began. The result was a semi-open savanna, with scattered large oaks, oak grubs, and small groves of jack pine.

The north-central stand is located on a peninsula within the Flowage. It is smaller, more isolated, and somewhat weedier than the eastern barrens, but supports several rare species such as dwarf milkweed and the Karner blue butterfly. At this time it might best be characterized as an oak barrens with a brush prairie aspect, rather than as a savanna with scattered large trees. Representative plants include little bluestem, June grass, lupine, goat's rue, bastard toadflax, sweet fern, and early blueberry. Oak grubs (northern pin and/or black oaks) to a height of several meters are abundant. Kentucky bluegrass and sheep sorrel, two exotic plant species, are locally common. It's possible that past grazing and/or a long period of fire suppression may have severely reduced or eliminated some of the pine barrens understory species, including some prairie forbs.

Resident birds include Rufous-sided Towhee, Brown Thrasher, Yellow, Chestnut-sided, Nashville, and Golden-winged Warblers, Common Nighthawk, Eastern Bluebird, and Red-headed Woodpecker.

The site is entirely within the boundaries of the Necedah National Wildlife Refuge. Surrounding lands are used for wildlife protection, recreation, and timber production where it is compatible with the other primary uses.

Early in the 20th century much of this area was cleared for short-lived, ill-advised, and ultimately unsuccessful attempts at agriculture. Site hydrology was severely modified by extensive ditching at that time. A system of dikes and water control structures constructed by the US Fish and Wildlife Service has restored some of the functionality of the nearby wetlands.

Significance of Site

Barrens communities are globally rare and continue to decline in acreage and quality due to fire suppression policies, conversion to forest production areas, and colonization by aggressive invasive plants. Central and northwestern Wisconsin offer some of the nation's best opportunities to protect and restore functional stands of pine and oak barrens. This site contains good quality though small remnants, could be substantially

expanded, and supports rare and declining plant and animal species. Significant expansion is now underway south of the easternmost barrens patch.

Management Considerations

The barrens communities have been actively managed by a combination of prescribed burning and mechanical brushing. The feasibility of integrating the individual units of this site into a larger, managed barrens landscape should be investigated.

EX20 - Rynearson Flowage Barrens Element Occurrences

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status	US ESA Status
Animals						
Lycaeides melissa samuelis	Karner blue butterfly	1996	S2S3	G5T2	SC/FL	LE
Plants						
Asclepias ovalifolia	dwarf milkweed	1997	S3	G5?	THR	
Bartonia virginica	yellow screwstem	1990	S3	G5	SC	
Communities						
Northern Sedge Meadow	Northern Sedge Meadow	1981	S3	G4	NA	
Oak Barrens	Oak Barrens	1997	S2	G2?	NA	
Shrub-Carr	Shrub-Carr	1981	S4	G5	NA	

EX21. YELLOW RIVER BOTTOMS

Location

Subsection:	Central Wisconsin Sand Plain (222Ra)
County:	Wood, Juneau
USGS 7.5' Quadrangle:	Babcock, Finley, Necedah, New Miner, and Quail Point Flowage
Town-Range-Section:	T18N-R3E, sections 1 and 12
	T18N-R4E, sections 6 and 7
	T19N-R3E, sections 1-3, 10-14, 22, 23, 24-26, 35, and 36
	T19N-R4E, sections 6, 7, 19, 30, and 31
	T20N-R3E, sections 3, 4, 9-11, 14-16, 21-27, and 34-36
	T20N-R4E, sections 31
	T21N-R3E, sections 14, 15, 22, 23, 26, 27, 34, and 35
Approximate Size:	14,376

Description of Site

This site delimits a five mile stretch of deciduous floodplain forest along the Yellow River north of Necedah. The river has an extremely low gradient, with many meanders, oxbows, running sloughs, cut-offs, and ponds. The soils are saturated and composed of glacial lake deposits and alluvial sediments. Mature portions of the forest are composed primarily of large silver maple, swamp white oak, river birch, green ash, hackberry, cottonwood, basswood, and red oak. Slightly elevated areas within the floodplain sometimes support white pine, white and black oaks, bigtooth aspen, and rarely, red pine. Reproducing trees include silver maple, green ash, and basswood. The shrub layer varies in density from sparse to dense, with locally common patches of buttonbush, gray dogwood, and prickly-ash. Common understory herbs include wood nettle, green-headed coneflower, dragonhead, and many sedges and grasses.

Noteworthy animals representative of this site include Red-shouldered Hawk, Barred Owl, Prothonotary Warbler, Cerulean Warbler, Acadian Flycatcher, American Redstart, Veery, Wood Thrush, and Blue-gray Gnatcatcher, and eastern Massasauga rattlesnake. The soils are generally sandy, though often covered with a layer of silt.

Disturbances to the floodplain include grazing and logging, but intact stands with large trees, high canopy closure, and some structural attributes of older forests (e.g., snags, coarse woody debris, tip-ups) still remain and it is the larger of these stands that support the greatest number of sensitive forest species. Small inclusions of sedge meadow, emergent marsh, and shrub swamp are present, as are open water areas in the ponds, oxbows, and cut-off sloughs that are common within the floodplain.

The adjacent uplands support oak and oak-pine forests, red pine plantations, old fields, a few active farms, and a large commercial cranberry operation along Cranberry Creek, a tributary of the Yellow. Most, if not all, of these forests have been periodically logged. The site is also used for recreation.

Significance of Site

This is arguably the most extensive and ecologically significant forested floodplain in the central sands ecoregion. The river is free-flowing between the villages of Dexterville and Babcock. The most intact portions of the site are relatively undisturbed, contain mature forest with old-growth attributes, and support a rich flora. The forests and associated wetland communities also support rare resident birds and herptiles.

Management Considerations

Virtually none of this corridor is protected, and commercial logging and hydrologic manipulation continue to impact the site. Protection of one to several substantial core areas of mature forest is needed if the site is to continue to provide viable habitat for rare forest interior species. The Yellow River Bottoms should also be considered as an integral part of a much larger landscape protection project opportunity.

EX21 - Yellow River Bottoms

Scientific Name	Common Name	Date	State Rank	Global Rank	WI Status	US ESA Status
Animals						
Buteo lineatus	Red-Shouldered Hawk	1998	S1N,S3S4B	G5	THR	
Cicindela lepida	little white tiger beetle	1979	S2S3	G4	SC/N	
Cicindela patruela huberi	a tiger beetle	1970	S3	G3T2	SC/N	
Clemmys insculpta	wood turtle	1992	S3	G4	THR	
Dendroica cerulea	cerulean warbler	1991	S2S3B,SZN	G4	THR	
Empidonax virescens	Acadian flycatcher	1991	S2S3B,SZN	G5	THR	
Etheostoma clarum	western sand darter	1973	S3	G3	SC/N	
Hemidactylium scutatum	four-toed salamander	1998	S3	G5	SC/H	
Lycaeides melissa samuelis	Karner blue butterfly	1994	S2S3	G5T2	SC/FL	LE
Lythrurus umbratilis	redfin shiner	1973	S3	G5	THR	
Microtus ochrogaster	prairie vole	1974	S2	G5	SC/N	
Nyctanassa violacea	yellow-crowned night-heron	1984	S1B,SZN	G5	THR	
Ophisaurus attenuatus	western slender glass lizard	1995	S2	G5	END	
Sistrurus catenatus catenatus	eastern massasauga rattlesnake	1994	S2	G3G4T3T4	END	C
Stylurus scudderi	zebra clubtail	1998	S3	G4	SC/N	
Plants						
Bartonia virginica	yellow screwstem	1998	S3	G5	SC	
Platanthera flava var herbiola	pale green orchid	1994	S2	G4T4Q	THR	
Rhexia virginica	virginia meadow-beauty	1998	S2	G5	SC	
Communities						
Floodplain Forest	Floodplain Forest	1992	S3	G3?	NA	